

and female threaded sections are matingly inserted to preselected penetrations in the coupler past engagement of the coupler engagement members with the coupler ends.

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(continued) 2. A connection as set forth in claim 1 above, wherein the preselected penetration for each pin end is to a chosen displacement beyond insertion to the hand tight plane, whereby lengths of the pin end sections from the end faces are in compression and coextensive lengths of the coupler are in tension and the mating threads lock under prestress to inhibit relative movement.

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Sub B7 5. A connection for sucker rods as set forth in claim 1 above, further including a torque washer of a selected axial dimension with flat transverse sides and disposed centrally in the coupler between the pin end faces and engaged on each side by the flat end faces of the pin ends.

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Sub B7 8. A connection for sucker rods used in pumping in oil well installations, comprising:

a sleeve coupling with an interior female threaded surface and tensioned in accordance with API specifications and having end walls of given radial dimension;

a pair of sucker rod pin ends, each threaded into the coupling from a different end, each of the pin ends having a male threaded end portion with an end face transverse to the longitudinal axis of the rod that deviates less than about 0.0005" from an end face plane, a transverse shoulder spaced from the end plane by a pre-stress dimension, and an undercut pin neck between the root thread of the male thread and the transverse shoulder, and

a torque disk having parallel planar faces spaced apart by a predetermined axial distance the faces deviating from a plane by less than about 0.0005 inches and the torque disk being of different material than the pin ends,

where the spacings between the pin ends and the shoulders, and the axial distance between torque disk faces are selected such that with thread makeup to an operative tightness the end regions of the coupling are in compression coextensive with the pin neck regions and in tension coextensive with the torque disk, and pressure and frictional contact are maintained between the pin ends and torque disk and the end walls of the coupling and the pin shoulders.

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(cont'd)

Sub B-28. A connection for sucker rods used in pumping installations in oil wells, comprising:

a sleeve coupling with interior counter bores at each end region and with an interior and female threaded surface between said counter bores and dimensioned in accordance with API or manufacturer's specifications and having end walls of given radial dimension and axial dimension within tolerances of ± 0.0005 in. relative to nominal dimensions within the selected specifications;

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a pair of sucker rod pin ends, each threaded into the coupling from a different end, each of the pin ends having a male threaded end portion with an end face transverse to the longitudinal axis of the rod that deviates less than about 0.0005 in. from a nominal end face plane, a transverse shoulder spaced from the end face plane by a pre-stress dimension, and an undercut pin neck between the root of the male thread and the transverse shoulder, and

a torque disk having parallel planar faces spaced apart by a predetermined axial distance between the torque disk faces selected such that with thread

makeup to an operative penetration in the coupling, the end regions in the coupling are in compression coextensive with the pin neck regions and the center region of said coupling is in tension coextensive with the torque disk, and compressive force and frictional contact are maintained between the pin ends and the end walls of the coupling and the shoulders.

29. A sucker rod coupling unit comprising:

a sleeve coupling and two sucker rod pin ends with predetermined dimensional criteria, and the pin ends including pin neck areas and adjacent shoulders, and the coupling unit further including a torque disk between the pin ends, and being made up with torque or circumferential displacement methods to establish compressive contact forces between the pin end shoulders and coupling end areas and pin thread end areas and the torque disk, and tension forces in pin neck areas and in the mid region of the sleeve coupling;

said induced forces imparting a pre-stress into the made up coupled unit at a degree calculated so as to be higher for each sucker rod size and material than any stresses induced by future operating loads.

30. A coupling unit as in claim 29 with dimensions such that when made up with either a torque or circumferential displacement method it establishes a pre-stress level in the unit that eliminates detrimental relative movement between the three combined parts approaching or at the microstructure level of the materials used in the parts.

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